

LONDON- WEST MIDLANDS ENVIRONMENTAL STATEMENT

Volume 5 | Technical Appendices

CFA6 | South Ruislip to Ickenham

Construction assessment (SV-003-006)

Sound, noise and vibration

November 2013

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Department
for Transport

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1 Introduction

- 1.1.1 The sound, noise and vibration appendices comprise four sections. The first of these is an introduction to the relevant policy and methodology (Volume 5: Appendix SV-001-000). This relates to the sound, noise and vibration assessment for all community forum areas (CFA).
- 1.1.2 For the South Ruislip to Ickenham community forum area (CFA 06), the other three sections are as follows:
- baseline sound, noise and vibration (Volume 5: Appendix SV-002-006);
 - construction sound, noise and vibration (Volume 5: Appendix SV-003-006) (this appendix); and
 - operational sound, noise and vibration (Volume 5: Appendix SV-004-006).
- 1.1.3 The outcomes of the assessment are summarised in Volume 2: CFA Report 06, South Ruislip to Ickenham (CFA Report 06), Section 11.
- 1.1.4 Maps referred to throughout the sound, noise and vibration appendices are contained in the Volume 5, Sound, Noise and Vibration Map Book.
- 1.1.5 This appendix presents the likely noise and vibration impacts, effects and significant effects arising from the construction of the Proposed Scheme for the South Ruislip to Ickenham area on:
- people, primarily where they live ('residential receptors') in terms of:
 - individual dwellings;
 - on a wider community basis, including any shared community open areas; and
 - community facilities such as schools, hospitals, places of worship, and also commercial properties such as offices and hotels, collectively described as 'non-residential receptors' and 'quiet areas'.
- 1.1.6 The assessment of likely impacts, effects and significant effects from construction noise and vibration on agricultural, community, ecological or heritage receptors and the assessment of tranquillity are presented in the following documents within Volume 5:
- | | |
|-----------------------------------|---------------------|
| • Agriculture, forestry and soils | Appendix AG-001-006 |
| • Community | Appendix CM-001-006 |
| • Ecology | Appendix EC-005-006 |
| • Heritage | Appendix CH-003-006 |
| • Landscape and Visual | Appendix LV-001-006 |

1.2 Evaluation of impacts and effects

- 1.2.1 This appendix provides a quantitative assessment of construction noise and vibration impacts/effects and a qualitative assessment of likely significant effects, based on the impacts/effects identified and other local context information consistent with the scope and methodology defined for the Proposed Scheme.
- 1.2.2 Indirect effects arising from temporary changes in traffic patterns on the existing road network as a consequence of constructing the Proposed Scheme are also reported in this appendix, where they will occur within the study area (as defined in Volume 5: Appendix SV-001-000).
- 1.2.3 In undertaking the assessment of sound and vibration, consistent with Environmental Impact Assessment (EIA) Regulations and emerging National Planning Practice Guidance¹ a differentiation between impacts effects, adverse effects and significant effects is made. Further information is provided in Volume 5: Appendix SV-001-000.
- 1.2.4 The assessment of impacts and effects has been undertaken at assessment locations that are representative of a number of dwellings or other sensitive receptors. The assessment locations employed in this assessment are presented in Maps SV-03-008 and SV-03-009 (Volume 5, Sound, Noise and Vibration Map Book).

¹ Information is provided in the Department for Communities and Local Government's emerging National Planning Practice Guidance – Noise <http://planningguidance.planningportal.gov.uk>, (refer to the noise exposure hierarchy), as available on 14th October 2013

2 Scope, assumptions and limitations

2.1 Regional and local policy guidance

2.1.1 The policy framework for sound, noise and vibration is set out in Volume 1 and in Volume 5: Appendix SV-001-000. As part of the engagement with local authorities through the Planning Forum Sub Group - Acoustics, information regarding any specific local planning guidance in respect of noise and vibration has been requested. Whilst no information has been received for this study area via the Planning Forum Sub Group - Acoustics, the following local policy guidance on noise and vibration has been identified:

- The Hillingdon Unitary Development Plan September 1998.

2.1.2 This guidance has been considered as part of formulating the detailed application of the impact and significance criteria set out in Volume 5: Appendix SV-001-000.

2.2 Engagement

2.2.1 Details of engagement on a route-wide basis with the local and county authorities' Environmental Health Practitioners via the Planning Forum Sub Group - Acoustics, is set out in Volume 1.

2.2.2 Engagement with communities has been via the Community Forums, as set out in Volume 1. In respect of sound, noise and vibration the following discussions have taken place:

- general discussions in respect of local issues, including possible ways to avoid and mitigate the potential impacts of noise or vibration;
- September / October 2012: a specific presentation about sound, noise and vibration with discussion afterwards with one of the project team specialists;
- November / December 2012: specific request for the Community Forum regarding baseline sound monitoring locations;
- January / February 2013: feedback to the Community Forum on any proposed baseline monitoring locations; and
- verbal / written responses to questions and sound, noise and vibration.

2.3 Methodology

2.3.1 The methodology used for the assessment of airborne sound, ground-borne sound and vibration impacts and the determination of significant effects is defined in the Scope and Methodology Report (SMR) (Volume 5: Appendix CT-001-000/1). Further clarification regarding specific areas is presented in the SMR addendum (Volume 5: Appendix CT-001-000/2). Further information is contained in Volume 5: Appendix SV-001-000.

2.4 Assumptions

- 2.4.1 Route-wide assumptions are outlined in Volume 1 and are further detailed in Volume 5: Appendix SV-001-000. Local assumptions that apply to the assessment of construction sound noise and vibration within this area are set out in Volume 2: CFA Report 06.
- 2.4.2 Tunnel boring machines (TBM) will be used to excavate the tunnels. Materials (including tunnel lining segments), people and equipment will be transported from the surface to each TBM using small construction trains, which will travel at relatively low speeds. Excavated material from each TBM will be transported to the surface by conveyor. It has been assumed that significant noise and vibration effects arising from use of the temporary railway will be avoided through appropriate design and maintenance specification. Other methods material movement may be employed; however, these will result in lower ground-borne noise and vibration.

2.5 Limitations

- 2.5.1 The route-wide limitations and the approach adopted to assure that they will not impact the robust assessment of sound, noise and vibration are presented in Volume 5: Appendix SV-001-000. No specific additional limitations are identified for this study area.

3 Environmental baseline

3.1 Existing baseline

- 3.1.1 Baseline sound level data has been collected at locations representative of the airborne sound-sensitive receptors. The existing and future baseline airborne sound levels derived from these measurements are given in Volume 5: Appendix SV-002-006. Details of the baseline data collection and the methodology are given in Volume 5: Appendix SV-001-000 and specifically for this study area in Volume 5: Appendix SV-002-006.

3.2 Future baseline

- 3.2.1 The assessment of noise from construction activities assumes a baseline year of 2017 which represents the period immediately prior to the start of the construction period. As a reasonable worst case, it has been assumed that no change in baseline sound levels will occur between the existing baseline (2012/13) and the future baseline year of 2017. The assessment of noise from construction traffic assumes a baseline year of 2021, representative of the middle of the construction period when the construction traffic flows are expected to be at their peak. Further information can be found in the Traffic and Transport assessment (Volume 5: Appendix TR-001-000).

4 Effects arising during construction

4.1 Introduction

4.1.1 The assessment is reported first for ground-borne sound and vibration and then for airborne sound. Under each of these headings, the results of the quantitative identification of impacts and effects are presented. This is followed by the identification of significant effects and the evidence used to support these conclusions.

4.1.2 The structure of this assessment report is as follows:

- Avoidance and mitigation measures
- Quantitative identification of impact and effects
 - Ground-borne sound and vibration
 - residential
 - non-residential
 - Airborne sound
 - residential
 - non-residential
- Assessment of impacts and effects
 - residential receptors: direct effects – dwellings
 - residential receptors: direct effects – communities
 - residential receptors: indirect effects
 - non-residential receptors: direct effects
 - non-residential receptors: indirect effects
 - cumulative effects from the Proposed Scheme and other committed development

4.2 Avoidance and mitigation measures

4.2.1 These measures are set out in Volume 2: CFA Report 06.

4.3 Quantitative identification of impacts and effects

Ground-borne sound and vibration

4.3.1 TBM will be used to excavate the tunnels. Each TBM is likely to generate ground-borne noise and vibration impacts but only at receptors within a close distance of the centre line of the tunnels and only for short periods of time (a few days). Overall, the

deeper the tunnel is, the lower the impact. The perceptible noise and vibration will increase as each TBM approaches and diminish as it moves away from the receptor. Vibration from TBM will present no risk of any building damage.

- 4.3.2 The effects of vibration from TBM on building occupants will be short term (a matter of days) and hence they are not considered to be significant. Proactive and advanced community relations in advance of each TBM passing under properties will help manage expectations and allay possible concerns over the short term presence of vibration.
- 4.3.3 No impacts have been predicted as the result of ground-borne sound and vibration in this area.

Airborne sound: direct impacts and effects

- 4.3.4 Activities associated with the construction phases of the Proposed Scheme will generate airborne noise. The assessment of the likely impacts and significant effects as a result of the construction noise has considered the effects on:
- residential receptors, both as individual dwellings and communities; and
 - non-residential receptors, including quiet areas.
- 4.3.5 For each type of receptor, subject to the screening distances identified, and based upon supplied plant information from engineers, the typical and highest monthly $L_{pAeq,T}$ noise levels from construction activities have been calculated at the façade of all assessment locations, which are representative of a number of receptors in the study area.
- 4.3.6 Volume 2 makes reference to any major construction activity during the evening and at night but the assessment has also considered the minor essential activities that will have to operate on a 24/7 basis for reasons of safety and engineering practicability (e.g. water pumps).
- 4.3.7 The assessment results, impact criteria and significance criteria for the assessment of the scheme at residential and non-residential receptors are presented in Table 1 and Table 2 respectively
- 4.3.8 The construction activity resulting in highest forecast noise levels is reported in Table 1 and Table 2 for each assessment location and time period, where the highest forecast noise level from any individual construction activity is above $L_{pAeq,T}$ 40dB during the daytime and evening periods and $L_{pAeq,T}$ 35dB during the night-time. Where the highest forecast noise level from any individual construction activity is less than $L_{pAeq,T}$ 40dB during the daytime and evening or $L_{pAeq,T}$ 35dB during the night-time no activities have been reported.
- 4.3.9 Explanation of the information within Table 1 and Table 2 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:

	Where the significant effect column is highlighted in pink, then a significant effect is identified at the referenced community, or individual non-residential receptor
*	Significant effect – the quantitative impact methodology has identified either: <ol style="list-style-type: none"> 1) no impact at this receptor but further information (see assessment) has identified that a significant effect is nonetheless likely; or 2) an impact at this receptor which, based upon further qualitative receptor information, (see assessment text) does not give rise to a significant effect.
~	Significant effect - impacted dwellings which are either spatially remote from larger defined residential areas, or a small number of dwellings whose impact is not considered to represent the larger defined residential area, and as such are not considered to be part of a community significant effect.
A	Type of effect – adverse effect
S	Type of effect – significant adverse effect
NA	Type of effect – not generally an adverse effect
B	Type of effect – for non-residential receptors further detail about the type of effect is set out in the text of Appendix SV-001-000
R	Type of receptor - residential
G	Type of receptor: <ul style="list-style-type: none"> (G1) theatres, large auditoria and concert halls; (G2) sound recording and broadcast studios; (G3) places of meeting for religious worship, courts, cinemas, lecture theatres, museums and small auditoria or halls; (G4) schools, colleges, hospitals, hotels and libraries; or (G5) offices and general commercial premises.
T	Receptor design – typical
S	Receptor design - special
H	Existing environment – high existing ambient noise levels: daytime level more than 75dB, evening-time level more than 65dB or night-time level more than 55dB L_{pAeq} at the façade.
NI	Mitigation effect - identified as likely to qualify for noise insulation under the draft Construction Code of Practice (draft CoCP).
D,E,N	Impact duration (months) – duration of impact during the day (D), evening (E) or night (N).

Table 1: Assessment of construction noise at residential receptors

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
401424	Harvil Road, Harefield	54/65 [A]	<40/<40 [B]	<35/<35 [>C]	Day: Harvil Road stream bridge - culvert construction (possessions).	NA	1	R	T	H	-	-	-	-		
402608	Harvil Road, Harefield	45/56 [>C]	<40/<40 [>C]	<35/<35 [>C]	Day: Colne Valley viaduct: Section 1 - south abutment to grand union canal - construct northern jetty and temp trestles.	NA	2	R	T	H	-	-	-	-		
405821	St. Georges Drive, Ickenham	40/48 [A]	<40/<40 [A]	36/37 [B]	Day: sustainable placement areas - sustainable placement areas - off-road movement in deposition areas; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	53	R	T	-	-	-	-	-		
405890	Breakspear Road South, Ickenham	47/55 [A]	44/45 [C]	44/44 [>C]	Day: sustainable placement areas - sustainable placement areas - off-road movement in deposition areas; Evening: Northolt tunnel (west) - set-up site for tunnelling at west Ruislip; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	30	R	T	H	-	-	-	-		
408586	New Years Green Lane, Harefield	48/58 [A]	<40/<40 [A]	<35/<35 [C]	Day: Harvil Road stream bridge - culvert construction (possessions).	NA	6	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
408671	New Years Green Lane, Harefield	48/58 [A]	42/43 [A]	40/40 [C]	Day: Harvil Road stream bridge - culvert construction (possessions); Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	1	R	T	-	-	-	-	-	
408811	Harvil Road, Ickenham	53/65 [B]	<40/44 [C]	37/37 [>C]	Day: Harvil Road over Chiltern Lines - deck installation; Evening: Northolt tunnel (west) - set-up site for tunnelling at west Ruislip; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	1	R	T	H	-	-	-	-	
410569	The Greenway, Ickenham	55/60 [A]	55/56 [C]	<35/<35 [>C]	Day: West Ruislip tunnel portal - site preparation works; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	11	R	T	H	-	-	-	-	
410650	The Greenway, Ickenham	56/61 [A]	55/55 [A]	<35/<35 [C]	Day: West Ruislip tunnel portal - site preparation works; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities	A	16	R	T	-	-	-	E 24	-	CSVo6-Co2*

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
					from west to east.											
410706	Oak Avenue, Ickenham	51/56 [B]	49/50 [C]	<35/<35 [>C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	24	R	T	H	-	-	-	-		
410739	Oak Avenue, Ickenham	49/53 [B]	45/48 [C]	<35/<35 [>C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	20	R	T	H	-	-	-	-		
410896	Parkfield Road, Ickenham	47/52 [B]	46/46 [C]	<35/<35 [>C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	27	R	T	H	-	-	-	-		
410980	Parkfield Road, Ickenham	46/51 [B]	46/47 [C]	<35/<35 [>C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	35	R	T	H	-	-	-	-		
411779	Rectory Way, Ickenham	45/53 [B]	43/45 [C]	<35/35 [>C]	Day: Harvil Road over chiltern lines - deck installation;	NA	72	R	T	H	-	-	-	-		

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
					Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.										
411869	Charlton Close, Ickenham	44/53 [A]	42/44 [C]	<35/36 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	95	R	T	H	-	-	-	-	
412015	Hoylake Crescent, Ickenham	47/52 [A]	46/46 [A]	<35/<35 [B]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	16	R	T	-	-	-	-	-	
412058	Hoylake Crescent, Ickenham	48/56 [A]	43/46 [A]	<35/<35 [B]	Day: Gatemead embankment - retained structures; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	11	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700												
412180	Hoylake Crescent, Ickenham	43/49 [A]	44/44 [A]	<35/<35 [C]	Day: West Ruislip tunnel portal - site preparation works; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	20	R	T	-	-	-	-	-		
412363	Bushey Road, Ickenham	42/55 [A]	<40/<40 [C]	36/36 [>C]	Day: Copthall retaining structure - site set up; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	27	R	T	H	-	-	-	-		
412918	Bushey Road, Ickenham	44/53 [A]	40/42 [C]	<35/35 [>C]	Day: Gatemead embankment - retained structures; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	46	R	T	H	-	-	-	-		
413031	Hoylake Crescent, Ickenham	<40/50 [A]	<40/<40 [A]	<35/<35 [A]	Day: River Pinn underbridge - site preparation works.	NA	17	R	T	-	-	-	-	-		
413114	Pynchester Close, Ickenham	42/56 [A]	<40/<40 [A]	<35/<35 [A]	Day: Gatemead embankment - retained structures.	NA	44	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
413146	Bushey Road, Ickenham	47/56 [A]	41/45 [A]	<35/<35 [A]	Day: Gatemead embankment - retained structures; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	17	R	T	-	-	-	-	-		
413332	Copthall Road East, Ickenham	43/53 [A]	40/42 [C]	37/37 [>C]	Day: Brackenbury cutting - site clearance; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	99	R	T	H	-	-	-	-		
413480	Hoylake Crescent, Ickenham	42/55 [A]	<40/<40 [B]	<35/35 [C]	Day: Brackenbury cutting - site clearance; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	23	R	T	-	-	-	-	-		
413536	Hoylake Crescent, Ickenham	45/59 [A]	41/42 [B]	41/41 [C]	Day: River Pinn underbridge - site preparation works; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	12	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700- 1900	Evening 1900- 2300	Night 2300- 0700												
413556	Copthall Road west, Ickenham	45/57 [A]	<40/40 [C]	<35/<35 [>C]	Day: Gatemead embankment - retained structures.	NA	8	R	T	H	-	-	-	-		
413594	Copthall Road west, Ickenham	43/56 [A]	<40/40 [A]	<35/<35 [B]	Day: Gatemead embankment - retained structures; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	29	R	T	-	-	-	-	-		
413856	Elgar Close, Ickenham	41/50 [A]	<40/<40 [A]	<35/35 [B]	Day: Gatemead embankment - retained structures.	NA	44	R	T	-	-	-	-	-		
414117	St. Georges Drive, Ickenham	42/52 [A]	<40/<40 [A]	36/37 [B]	Day: Gatemead embankment - retained structures; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	46	R	T	-	-	-	-	-		
414183	Breakspear Road South, Ickenham	47/59 [A]	44/45 [C]	44/44 [>C]	Day: Copthall retaining structure - site set up; Evening: Northolt tunnel (west) - set-up site for tunnelling at west Ruislip; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	37	R	T	H	-	-	-	-		
415660	Rectory Way, Ickenham	44/53 [A]	42/44 [C]	<35/35 [>C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt	NA	91	R	T	H	-	-	-	-		

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
					northbound tunnel – tunnel boring activities from west to east.										
416858	Kenbury Close, Ickenham	43/51 [A]	<40/41 [B]	39/39 [C]	Day: Copthall retaining structure - site set up; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	130	R	T	-	-	-	-	-	
417742	Swakeleys Road, Ickenham	42/52 [A]	40/41 [A]	37/37 [A]	Day: Harvil Road over chiltern lines - deck installation; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	98	R	T	-	-	-	-	-	
418434	Breakspear Road South, Harefield	46/57 [A]	<40/42 [C]	<35/<35 [C]	Day: Breakspear Road South underbridge - construct seatings, bearings, deck; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	3	R	T	-	-	-	-	-	
418507	Tile Kiln Lane,	47/58	42/44	<35/35	Day: Breakspear Road South underbridge - construct seatings, bearings, deck; and	NA	6	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
	Harefield	[A]	[B]	[C]	Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.											
418583	Tile Kiln Lane, Harefield	47/56 [A]	42/44 [B]	<35/<35 [C]	Day: Breakspear Road South underbridge - construct seatings, bearings, deck; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	1	R	T	-	-	-	-	-		
418730	Allonby Drive, Ruislip	44/53 [A]	<40/42 [C]	<35/<35 [C]	Day: West Ruislip retained embankment - site clearance; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	147	R	T	H	-	-	-	-		
418969	Tile Kiln Lane, Harefield	49/58 [A]	44/46 [B]	<35/35 [C]	Day: West Ruislip retained embankment - site clearance; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	8	R	T	-	-	-	-	-		
419116	Breakspear Road South,	52/63 [A]	<40/40 [A]	<35/<35 [C]	Day: Gatemead embankment - retained structures; and Evening: Northolt tunnel (west) - Northolt	NA	3	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Ickenham				northbound tunnel – tunnel boring activities from west to east.										
419154	Hoylake Crescent, Ickenham	47/62 [A]	41/42 [A]	39/39 [A]	Day: River Pinn underbridge - construction works - superstructure works; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	25	R	T	-	-	-	-	-	
419186	Hoylake Crescent, Ickenham	54/64 [A]	41/42 [B]	40/41 [C]	Day: River Pinn underbridge - construction works - superstructure works; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	8	R	T	-	-	-	-	-	
419214	Hoylake Crescent, Ickenham	52/63 [A]	41/43 [B]	38/39 [C]	Day: River Pinn underbridge - construction works - superstructure works; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities	NA	10	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
					from west to east.										
419263	Hoylake Crescent, Ickenham	47/57 [A]	41/45 [A]	<35/<35 [C]	Day: River Pinn underbridge - site preparation works; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	11	R	T	-	-	-	-	-	
419323	Breakspear Road South, Harefield	56/65 [A]	43/45 [C]	<35/37 [C]	Day: River Pinn underbridge - construction works - superstructure works; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	8	R	T	-	-	-	-	-	CSVo6-Co3*
420281	New Years Green Lane, Harefield	44/53 [A]	<40/<40 [A]	<35/<35 [B]	Day: sustainable placement areas - sustainable placement areas - off-road movement in deposition areas.	NA	9	R	T	-	-	-	-	-	
420688	Lysander Road, Ruislip	42/49 [A]	<40/43 [C]	<35/<35 [>C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	24	R	T	H	-	-	-	-	
420766	Ickenham Close,	48/55	40/47 [A]	<35/<35	Day: West Ruislip tunnel portal - site	NA	28	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Ruislip	[A]		[B]	preparation works; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.										
420916	Ickenham Close, Ruislip	<40/45 [A]	<40/40 [A]	<35/<35 [B]	Day: West Ruislip tunnel portal - diaphragm wall construction.	NA	49	R	T	-	-	-	-	-	
421034	Cranston Close, Ickenham	45/54 [A]	<40/44 [C]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	166	R	T	-	-	-	-	-	
421089	Aylsham Drive, Ickenham	43/50 [A]	<40/41 [B]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	179	R	T	-	-	-	-	-	
421774	Lysander Road, Ruislip	44/49 [A]	<40/43 [C]	<35/<35 >[C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	130	R	T	H	-	-	-	-	
422160	Ickenham Close, Ruislip	41/47 [A]	<40/40 [A]	<35/<35 [B]	Day: West Ruislip tunnel portal - diaphragm wall construction.	NA	19	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
422482	Oak Avenue, Ickenham	48/54 [A]	47/47 [A]	<35/<35 [B]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	20	R	T	-	-	-	-	-		
422588	The Greenway, Ickenham	53/61 [A]	50/51 [B]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	16	R	T	-	-	-	-	-		
422618	The Greenway, Ickenham	54/60 [A]	52/53 [A]	<35/<35 [B]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	6	R	T	-	-	-	-	-		
422671	The Greenway, Ickenham	56/60 [A]	55/56 [A]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	A	11	R	T	-	-	-	E 24	-	CSVo6-Co2	
422883	Haslam Close, Ickenham	44/51 [A]	<40/42 [B]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities	NA	111	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
					from west to east.										
422977	The Greenway, Ickenham	60/69 [A]	46/54 [B]	<35/<35 [C]	Day: canal feeder underbridge - construction works - superstructure; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	A	20	R	T	-	-	-	D 20	-	CSVo6-Co2
422998	The Greenway, Ickenham	61/68 [A]	58/58 [C]	<35/<35 [>C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	A	10	R	T	H	-	-	D 12	-	CSVo6-Co2
423037	The Greenway, Ickenham	58/63 [A]	58/58 [C]	<35/<35 [>C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	10	R	T	H	-	-	-	-	
423100	Ickenham Road, Ruislip	49/55 [>C]	41/48 [>C]	<35/<35 [>C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	12	R	T	H	-	-	-	-	
423112	Ickenham Road, Ruislip	55/64 [A]	44/52 [B]	<35/<35 [>C]	Day: West Ruislip tunnel portal - site preparation works; and	NA	10	R	T	H	-	-	-	-	

Assessment location		Impact criteria			Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
					Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.										
423340	The Greenway, Ickenham	63/74 [A]	51/55 [C]	45/45 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: West Ruislip tunnel portal - general.	S	12	R	T	-	-	-	D 21	-	CSV06-Co2
423354	The Greenway, Ickenham	64/73 [A]	50/57 [C]	36/40 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: West Ruislip tunnel portal - general.	A	12	R	T	-	-	-	D 22	-	CSV06-Co2
423385	The Greenway, Ickenham	57/65 [A]	55/55 [A]	<35/<35 [B]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	11	R	T	-	-	-	-	-	
423730	Parkfield Road, Ickenham	44/52 [A]	42/45 [A]	<35/<35 [B]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities	NA	24	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
					from west to east.										
426310	Ravenscourt Close, Ruislip	45/54 [A]	41/43 [B]	<35/<35 [C]	Day: Breakspear Road South underbridge - construct seatings, bearings, deck; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	52	R	T	-	-	-	-	-	
426811	Woodville Gardens, Ruislip	47/55 [A]	42/45 [B]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	23	R	T	-	-	-	-	-	
427629	Larkspur Close, Ruislip	45/55 [A]	40/43 [B]	<35/<35 [C]	Day: Breakspear Road South underbridge - Construct Seatings, bearings, deck; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	69	R	T	-	-	-	-	-	
428888	Harwell Close, Ruislip	51/58 [A]	46/48 [C]	<35/<35 [>C]	Day: Canal feeder underbridge - construction works - superstructure; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	10	R	T	H	-	-	-	-	
428937	Ickenham Road, Ruislip	48/56 [A]	44/46 [B]	<35/<35 [>C]	Day: canal feeder underbridge - construction works - superstructure; and	NA	34	R	T	H	-	-	-	-	

Assessment location		Impact criteria			Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
					Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.										
429574	Glenhurst Avenue, Ruislip	48/56 [A]	43/46 [B]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	46	R	T	-	-	-	-	-	
429655	Glenhurst Avenue, Ruislip	48/56 [A]	43/46 [B]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	84	R	T	-	-	-	-	-	
429776	Field Way, Ruislip	48/56 [A]	44/47 [B]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	36	R	T	-	-	-	-	-	
429830	Hill Rise, Ruislip	48/56 [A]	43/47 [B]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	28	R	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
433144	Ickenham Road, Ruislip	59/70 [C]	49/54 [C]	37/42 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: West Ruislip tunnel portal - general.	NA	3	R	T	H	-	-	-	-		
433365	Heacham Avenue, Ickenham	48/56 [A]	<40/45 [B]	<35/<35 [C]	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	101	R	T	-	-	-	-	-		
700377	The Greenway, Ickenham	52/59 [A]	49/52 [C]	<35/<35 [C]	Day: West Ruislip tunnel portal - site preparation works; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	NA	5	R	T	H	-	-	-	-		
700478	Portal Close, Ruislip	49/56 [A]	<40/47 [A]	-	Day: South Ruislip vent shaft - diaphragm wall construction (possessions); and Evening: South Ruislip vent shaft - base slab construction.	NA	6	R	T	-	-	-	-	-		
700479	Trenchard Avenue, Ruislip	53/61 [A]	<40/50 [A]	-	Day: South Ruislip vent shaft - diaphragm wall construction (possessions); and Evening: South Ruislip vent shaft - base slab	NA	3	R	T	-	-	-	-	-		

Assessment location		Impact criteria				Significance criteria										Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect		
		Day 0700-1900	Evening 1900-2300	Night 2300-0700												
					construction.											
700482	Tiptree Road, Ruislip	45/49 [A]	<40/43 [A]	-	Day: South Ruislip vent shaft - diaphragm wall construction (possessions); and Evening: South Ruislip vent shaft - base slab construction.	NA	4	R	T	-	-	-	-	-		

Table 2: Assessment of construction noise at non-residential receptors

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
401424	Harvil Road, Harefield	54/65	-	-	Day: Harvil Road stream bridge - culvert construction (possessions).	B	1	G5	T	H	-	-	-	-	
411869	Charlton Close, Ickenham	44/53	42/44	-	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	B	2	G3	T	H	-	-	-	-	
417742	Swakeleys Road, Ickenham	42/52	40/41	37/37	Day: Harvil Road over Chiltern Lines - deck installation; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and Night: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	B	2	G4	T	-	-	-	-	-	
417742	Swakeleys Road, Ickenham	42/52	-	-	Day: Harvil Road over Chiltern Lines - deck installation.	B	22	G5	T	-	-	-	-	-	
418434	Breakspear Road South, Harefield	46/57	-	-	Day: Breakspear Road south underbridge - construct seatings, bearings, deck.	B	3	G5	T	-	-	-	-	-	
420281	New Years Green Lane,	44/53	-	-	Day: sustainable placement areas - sustainable placement areas - off-road movement in	B	3	G5	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L_{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Harefield				deposition areas.										
420688	Lysander Road, Ruislip	42/49	<40/43	-	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	B	1	G3	T	H	-	-	-	-	
420688	Lysander Road, Ruislip	42/49	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	1	G5	T	H	-	-	-	-	
420916	Ickenham Close, Ruislip	<40/45	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	3	G5	T	-	-	-	-	-	
421089	Aylsham Drive, Ickenham	43/50	<40/41	-	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	B	1	G3	T	-	-	-	-	-	
421089	Aylsham Drive, Ickenham	43/50	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	1	G5	T	-	-	-	-	-	
421774	Lysander Road, Ruislip	44/49	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	1	G5	T	H	-	-	-	-	
422588	The Greenway, Ickenham	53/61	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	1	G5	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
422977	The Greenway, Ickenham	60/69	-	-	Day: Canal feeder underbridge - construction works - superstructure.	B	5	G5	T	-	-	-	-	-	
423100	Ickenham Road, Ruislip	49/55	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	6	G5	T	H	-	-	-	-	
423730	Parkfield Road, Ickenham	44/52	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	3	G5	T	-	-	-	-	-	
428888	Harwell Close, Ruislip	51/58	46/48	-	Day: canal feeder underbridge - construction works - superstructure; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	B	1	G3	T	H	-	-	-	-	CSVo6-No2*
428937	Ickenham Road, Ruislip	48/55	44/46	-	Day: Canal feeder underbridge - construction works - superstructure; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	B	1	G3	T	H	-	-	-	-	
428937	Ickenham Road, Ruislip	48/56	-	-	Day: Canal feeder underbridge - construction works - superstructure.	B	1	G5	T	H	-	-	-	-	
433144	Ickenham Road, Ruislip	59/70	49/54	37/42	Day: West Ruislip tunnel portal - diaphragm wall construction; Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east; and	B	1	G4	T	H	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
					Night: West Ruislip tunnel portal - general.										
433144	Ickenham Road, Ruislip	59/70	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	1	G5	T	H	-	-	-	-	
433365	Heacham Avenue, Ickenham	48/56	<40/45	<35/<35	Day: West Ruislip tunnel portal - diaphragm wall construction; and Evening: Northolt tunnel (west) - Northolt northbound tunnel – tunnel boring activities from west to east.	B	2	G4	T	-	-	-	-	-	
700376	New Years Green Lane, Harefield	49/62	-	-	Day: Harvil Road stream bridge - culvert construction (possessions).	B	1	G5	T	-	-	-	-	-	
700378	Ickenham Road, Ruislip	72/82	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	1	G5	T	-	-	-	D 9	-	CSVo6-No1
700379	Ickenham Road, Ruislip	52/62	-	-	Day: West Ruislip tunnel portal - diaphragm wall construction.	B	1	G5	T	-	-	-	-	-	
700480	West End Road, Ruislip	56/63	-	-	Day: South Ruislip vent shaft - diaphragm wall construction (possessions).	B	1	G5	T	-	-	-	-	-	
700482	Tiptree Road, Ruislip	45/49	-	-	Day: South Ruislip vent shaft - diaphragm wall construction (possessions).	B	1	G5	T	-	-	-	-	-	
709518	Breakspear Road South,	51/64	-	-	Day: Copthall retaining structure - site	B	1	G5	T	-	-	-	-	-	

Assessment location		Impact criteria				Significance criteria									Significant effect
ID	Area represented	Typical/highest monthly outdoor L _{pAeq} [dB] at the façade			Construction activity resulting in highest forecast noise levels	Type of effect	Number of impacts represented	Type of receptor	Receptor design	Existing environment	Unique feature	Combined impact	Impact duration [months]	Mitigation effect	
		Day 0700-1900	Evening 1900-2300	Night 2300-0700											
	Harefield				preparation works.										
709519	Breakspear Road South, Harefield	57/69	-	-	Day: Gatemead embankment - retained structures.	B	1	G5	T	-	-	-	-	-	
709520	Breakspear Road South, Harefield	64/73	-	-	Day: Brackenbury cutting - site clearance.	B	1	G5	T	-	-	-	-	-	

Airborne sound: indirect effects

- 4.3.10 Construction road traffic associated with the construction phases of the Proposed Scheme will generate airborne noise. The change in traffic noise level at a reference distance of 10m from the edge of the nearside carriageway resulting from the presence of construction traffic for a given road has been predicted, based upon traffic information for the Proposed Scheme. The results for the roads where potentially significant effects could arise are presented in Table 3.
- 4.3.11 Explanation of the information within Table 3 is provided in Volume 5: Appendix SV-001-000, with the following additional notes:



Where the significant effect column is highlighted in dark red, then a significant effect is identified on nearby communities or individual receptors

Change values



Yellow denotes a minor impact – a change of between 3 and 5dB or between 1 and 3dB where a high existing sound level is identified



Orange denotes a moderate impact – a change of between 5 and 10dB or between 3 and 5dB where a high existing sound level is identified



Red denotes a major impact – a change of more than 10dB or more than 5dB where a high existing sound level is identified

Table 3: Assessment of construction traffic noise levels

Road name	Link	Future baseline sound level (dB)	Future baseline sound level construction traffic (dB)	Change (dB)	Significant effect
		Daytime L _{pAeq,16hr} 0700-23:00 free-field	Daytime L _{pAeq,16hr} 0700-2300 free-field		
Swakeleys Road	B467	69.3	72.4	+3.1	CSV06-Co4

4.4 Assessment of significant effects

Residential receptors: direct effects – individual dwellings

- 4.4.1 Taking account of the avoidance and mitigation measures set out in the previous paragraphs, one residential building (Oak Farm, Breakspear Road South) is forecast to experience noise levels higher than the noise insulation trigger levels as defined in the draft CoCP. For daytime construction the trigger level is an equivalent continuous noise level of 75dB².
- 4.4.2 The mitigation measures, including noise insulation, will reduce noise inside all dwellings, including the dwelling at Oak Farm, such that it does not reach a level where it will significantly affect¹ residents.
- 4.4.3 There is no representative assessment location assigned to Oak Farm, Breakspear Road South. Following further investigation of the noise model it is considered that Oak Farm will experience noise levels higher than the noise insulation trigger levels as defined in the draft CoCP.

Residential receptors: direct effects -communities

- 4.4.4 The avoidance and mitigation measures in this area will avoid airborne construction noise adverse effects¹ on the majority of receptors and communities. Residual temporary noise or vibration effects are identified later in this section.
- 4.4.5 The following activities will need to be undertaken during the evening and night-time for reasons of safety, engineering practicability or to reduce the impact on existing transport. Further information is provided in Section 2.3 of Volume 2: CFA Report 06 and in the draft CoCP:
- Harvil Road Pre-Casting Facility; and
 - Tunnelling activities at the West Ruislip tunnel portal.
- 4.4.6 The assessment takes into consideration the time of day that noise will be generated: noise at night is assessed against a more stringent criterion than that in the evening; and that in the evening against a more stringent criterion than that created during the day.
- 4.4.7 With regard to noise outside dwellings, the assessment of temporary effects takes account of construction noise relative to existing sound levels.
- 4.4.8 In locations with lower existing sound levels³, construction noise effects¹ are likely to be caused by changes to noise levels outside dwellings. These may be considered by the local community as an effect on the acoustic character of the area and hence be perceived as a change in the quality of life. These effects are considered to be significant when assessed on a community basis taking account of the local context³

² L_{pAeq,0800-1800} measured outside at the building façade.

³ Further information is provided in Volume 5: Appendix SV-001-000.

- 4.4.9 In this area, the direct construction noise effects on the acoustic character of the areas around the residential communities identified in Table 4 are considered to be significant.

Table 4: Likely significant construction noise and vibration effects on communities and associated facilities

Significant effect number	Type of significant effect	Time of day	Location	Cause (construction activities)	Assumed duration of impact and details
CSVo6-Co1	Construction Noise	Daytime	Approximately 24 dwellings in Cottesmore House, Perkins Gardens	West Ruislip tunnel portal Construction. Typical and highest monthly noise levels of 66dB and 69dB.	One year and five months
CSVo6-Co2	Construction Noise	Daytime	Approximately 46 dwellings on The Greenway, Ickenham	West Ruislip tunnel portal and canal feeder underbridge construction. Typical and highest monthly noise levels of 60-64dB and 68-75dB.	One year to one year and 10 months
		Evening	Approximately 27 dwellings on The Greenway, Ickenham	Northolt tunnel (West) - Launch & drive. Typical and highest monthly noise levels of 55dB and 55-56dB.	Two years
CSVo6-Co3	Construction Noise	Daytime	Approximately nine dwellings on Breakspear Road South, Harefield	Construction of the Breakspear Road south underbridge, River Pinn underbridge and West Ruislip retained embankment. Typical and highest monthly noise levels of 58-71dB and 66-78dB.	Two months to one year and one month

- 4.4.10 There is no representative assessment location assigned to Cottesmore House, Perkins Gardens. Following further investigation of the noise model it is considered that a significant effect is likely at approximately 24 dwellings. Therefore a community effect (CSVo6-Co1) has been identified at this location.
- 4.4.11 At Assessment Location 410650 the quantitative assessment has not indicated that a significant effect is likely at the western end of The Greenway. However, on a precautionary basis these dwellings have been included within the CSVo6-Co2 community effect.
- 4.4.12 At Assessment Location 419323 the quantitative assessment has not indicated that a significant effect is likely at Breakspear Road South. However, on a precautionary basis these dwellings have been included within the CSVo6-Co3 community effect.
- 4.4.13 There is no representative assessment location assigned to Oak Farm, Breakspear Road South. Following further investigation of the noise model it is considered that a

significant effect is likely, therefore it has been included in the local community effect (CSV06-Co3).

Residential receptors: indirect effects

- 4.4.14 Construction traffic is likely to cause adverse noise effects on residential receptors along the following local roads:
- 4.4.15 B467 Swakeleys Road where it passes through Ickenham (CSV06-04) - approximately 30 dwellings located immediately adjacent to the road are forecast to experience an increase in outdoor noise levels of around 3dB during the peak months (further information is provided in Section 12: Traffic and Transport).
- 4.4.16 These adverse effects¹ will be a change in the acoustic character of the area such that there is a perceived change in the quality of life. The effects are considered to be significant when assessed on a community basis taking account of the local context⁴.
- 4.4.17 The construction railhead at West Ruislip will be used for the movement of excavated materials, construction materials deliveries and as an access to the Proposed Scheme track route, for ballast and track laying. Movement of trains to and from the sidings and railheads on the classic rail network will utilise available train paths and will comprise a very small percentage of total train movements on the classic rail network. It is therefore unlikely that train movements associated with construction rail heads will result in a significant change in rail noise levels at residential receptors situated close to the classic rail network.

Non-residential receptors: direct effects

- 4.4.18 Significant construction noise or vibration effects have been identified on the following non-residential receptors:
- Ruislip Golf Centre, Ickenham Rd (CSV06-No1). Significant noise effects have been identified on a reasonably foreseeable worst case basis during the daytime with noise levels rising to 82dB over a period of approximately nine months commencing in 2017 during the construction of the West Ruislip tunnel portal .
 - The Church of Jesus Christ of Latter Day Saints, Ickenham Rd (CSV06-No2). Significant noise effects have been identified on a reasonably foreseeable worst case basis during the daytime with noise levels rising to 58dB over a period of approximately one year and two month commencing in 2017 during the construction of the West Ruislip tunnel portal.
- 4.4.19 At Assessment Location 428888 the quantitative assessment has not indicated that a significant effect is likely at The Church of Jesus Christ of Latter Day Saints. However, further interrogation of the noise model indicates that a significant effect is likely.

⁴ Refer to section 2 of Volume 2: CFA Report 06

Non-residential receptors: indirect effects

- 4.4.20 Significant noise effects on non-residential receptors arising from construction traffic are unlikely to occur in this area.
- 4.4.21 The construction railhead at West Ruislip will be used for the movement of excavated materials, construction materials deliveries and as an access to the Proposed Scheme track route, for ballast and track laying. Movement of trains to and from the sidings and railheads on the classic rail network will utilise available train paths and will comprise a very small percentage of total train movements on the classic rail network. It is therefore unlikely that train movements associated with construction rail heads will result in a significant change in rail noise levels at residential receptors situated close to the classic rail network.

Cumulative effects from the Proposed Scheme and other committed development

- 4.4.22 This assessment has considered the potential cumulative construction noise effects of the Proposed Scheme and other committed developments⁵. In this area, there are no developments that will be built at the same time as the Proposed Scheme and accordingly, construction noise or vibration from the Proposed Scheme is unlikely to result in any significant cumulative noise effects.

⁵ Refer to Volume 5: Appendix CT-004-000

5 References

Control of Pollution Act 1974 (c.40). London, Her Majesty's Stationery Office.